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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,000	11/12/2003	Kuppsuamy Kanakanjan	HP0087USNA	6531

23906 7590 09/09/2004

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/706,000	Applicant(s) KANAKARAJAN ET AL.	
	Examiner Cathy Lam	Art Unit 1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-17 and 19 is/are rejected.
- 7) ☒ Claim(s) 10 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11-12-03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02-20-2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-9 and 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanakarajan et al (US 5411765) or Rosenfeld (US 5922167).

Kanakarajan discloses a flexible multilayer polyimide-metal laminates. The laminate is comprised of at least one layer of metal or metal alloy, and one or more layers of a base polyimide. The laminate is used for printed circuit boards (col 1 L 37-42).

The polyimide is an aromatic polyimide and the polyimide is bonded to the metal layer through a heat sealable copolyimide adhesive layer (col 2 L 13-17). The adhesive layer is comprised of at least 60 mol% of aromatic diamine and no greater than 40 mol% of aliphatic diamine (col 2 L 17-40).

The heat sealable copolyimide adhesive is comprised of aromatic diamines such as 1,3-bis(4-aminophenoxy) benzene and 1,2-bis(4-aminophenoxy) benzene (col 5 L 65 & L 67). The adhesive further comprised of aromatic dianhydrides such as 2,3,2',3'-benzophenonetetracarboxylic dianhydride, etc. (col 3 L 27-32). The adhesive further includes aliphatic diamines such as hexamethylene diamine (col 5 L42, L28, L30, L65). The copolyimide adhesive layer has a  $T_g$  of  $< 250^\circ\text{C}$ .

Kanakarajan however is silent about the  $T_g$  of the polyimide base layer. The examiner takes the position that the copolyimide adhesive layer taught by Kanakarajan is the low glass transition temperature polyimide layer because the  $T_g$  is  $< 250^\circ\text{C}$ .

Rosenfeld discloses a polyimide adhesive that is used for bonding an IC chip to a lead frame (col 1 L 7-8).

The adhesive is comprised of an aliphatic diamine such as 1,12-dodecamethylenediamine (col 4 L 13-14). The adhesive further comprised aromatic diamine such as 1,3-bis(3-aminophenoxy)benzene (col 3 L 24-28). The adhesive further comprised of aromatic dianhydrides 2,2',3,3'-benzophenonetetracarboxylic dianhydride (col 2 L 14-20). The adhesive further comprised of aliphatic diamine such as BTDA, BPDA, etc. (col 2 L 54-55).

The polyimide adhesive is a mixture of aromatic diamine, aromatic dianhydride and aliphatic diamine, and the  $T_g$  varies depending on the mixture composition (Table under column 5).

In view of the prior art teachings, one skill in the art would choose a composition for the polyimide films used in the laminate and modify according to his invention because it is a matter of design scheme. One can also choose a combination of different  $T_g$  polyimide films and stack together to form a laminate because the low  $T_g$  film is commonly used as a bonding layer.

#### ***Allowable Subject Matter***

3. Claims 10 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if incorporate into independent claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
August 26, 2004